In one embodiment, detector 32 is a solid state detector or radiation imager comprising a large flat panel imaging device having a plurality of pixels 35 arranged in rows and columns. Each pixel 35 includes a photosensor (not shown), such as a photodiode, that is coupled via a switching transistor (not shown) to two separate address lines, a scan line and a data line. In each row of pixels, each respective switching transistor (typically a thin film field effect transistor (FET)) is coupled to a common scan line through that transistor's gate electrode. In each column of pixels, the readout electrode of the transistor (e.g., the source electrode of the FET) is coupled to a data line, which in turn is selectively coupled to a readout amplifier. During nominal operation, x-ray beams 17 passing through the object, for example a patient, being examined are incident on imaging array 32. The radiation is incident on a scintillator material and the pixel photosensors measure (by way of change in the charge across the diode) the amount of light generated by x-ray interaction with the scintillator. As a result, each detector element, or pixel, 35 produces an electrical signal that represents the intensity of an impinging x-ray beam and hence the attenuation of beam 17 as it passes through the object. During a scan to acquire x-ray projection data in one mode defined as a CT volume rotation mode, detector assembly 30 and source assembly 26 are rotated about the object.

Please delete the paragraph beginning on page 6 at line 9 and ending on page 6 at line 18, and replace with the following replacement paragraph:

In another embodiment of detector 32, x-rays 17 can directly generate electron-hole pairs in the photosensor (commonly called "direct detection"). The photosensor charge data are read out by sequentially enabling rows of pixels (by applying a signal to the scan line causing the switching transistors coupled to that scan line to become conductive), and reading the signal from the respective pixels thus enabled via respective data lines (the photodiode charge signal being coupled to the data line through the conductive switching transistor and associated readout electrode coupled to a data line). In this way a given pixel can be addressed though a combination of enabling a scan line coupled to the pixel and reading out at the data line coupled to the pixel.

Please delete the paragraph beginning on page 7 at line 5 and ending on page 7 at line 11, and replace with the following replacement paragraph:

a4

Computer 62 also receives commands and scanning parameters from an operator via a console 65 that has a keyboard. An associated cathode ray tube display 66 allows the operator to observe the reconstructed image and other data from computer 62. The operator supplied commands and parameters are used by computer 62 to provide control signals and information to DAS 58, x-ray controller 54 and motor controller 56. Computer 62 operates a table motor controller 68 which controls position of motorized table 46 relative to system 10.

Please delete the paragraph beginning on page 7 at line 26 and ending on page 8 at line 6, and replace with the following replacement paragraph:

a5

In one embodiment, a partially defective panel 100, i.e., known portions of panel elements 35 are non-responsive to x-ray signals, may be utilized to generate images of object 50. This may be accomplished by altering the distance between source 28 and detector 32. Specifically, the distance between source 28 and detector panel 100 is reduced so that the area of x-ray signal exposure is limited to the functioning portion of panel 100. For example, where any number of detector panel elements 35 are non-responsive so that the right 25% of panel 100 is unusable, the distance between detector 32, specifically panel 100, relative to source 28 may be altered so that the data is collected from the remaining 75% of panel 100. In another embodiment, detector panel 100 and/or source 28 may be positioned so that only the center 50% of panel 100 is utilized and the known defective 25% right and a corresponding 25% of the left side of panel 100 are unused to generate the image. The partially defective panel 100 may also be used by collimating x-ray beam 17 from source 28, using a collimator (not shown), so that the defective portion of panel 100 is not exposed to x-rays 17. As a result, x-ray dose to patient 50 is reduced.

Please delete the paragraph beginning on page 9 at line 1 and ending on page 9 at line 27, and replace with the following replacement paragraph:

Prior to selecting the CT volume rotating mode of system 10 by the operator, system 10 is positioned relative to object 50. As a result of the shape of arm 16, system 10 may be easily positioned adjacent to table 46. For example and referring again to Figure 5, where images are desired of a certain area of object 50, i.e., the lower portion of a patient's leg, system 10 is placed relative to table 46 so that arm 16 rotates about table 46. More specifically, system 10 is positioned near the end of table 46 so that as arm 16 rotates about a Z axis of object 50, source assembly 26 and detector assembly 30 move relative to table 46. Particularly and in one embodiment, arm 16 rotates about 180 degrees plus a fan angle about base 14. Arm 16 is rotated relative to base 14, source assembly 26 and detector assembly 30 are rotated about object 50 and table 46. X-rays signals are emitted from source 28 and collected by detector 32 as arm 16 is rotated. The signals collected from detector 32 are processed in a manner known in the art to generate an image of object 50, i.e., an image along the plane of interest of the patient's leg. More specifically and in one embodiment, arm 16 rotates about base 14 at a fairly slow speed, i.e., 3 to 10 seconds per rotation, and data is collected for each row of elements 32. Reconstructed images are then generated using data collected from elements 35 of detector 32. In one embodiment, the reconstructed images for each row of detector 32 are then combined to form a 3D image of object 50. The 3D image, in one embodiment, is a volume display, to understand the location of the elements contained within object 50, for example the bones within the patient. As described above, where detector 32 is non-symmetrical, the orientation of detector 32 may be altered to select the appropriate coverage area, i.e., a larger X-axis coverage area, and Field of View (FOV), i.e., a larger Z-axis coverage area. After the images are generated, the operator may reposition system 10 relative to object 50 or select a different mode of operation. In addition, if the operator has completed all tasks, system 10 may be removed without interfering with or disturbing object 50.

Please delete the paragraph beginning on page 9 at line 29 and ending on page 10 at line 7, and replace with the following replacement paragraph:

A1 The CT volume sliding mode allows image generation of objects having a shape, placement, or configuration which are difficult or impossible to image using known imaging systems. More specifically, and as shown in Figures 4 and 7 where system 10 is placed along one of the sides of table 46, arm 16 is moved relative to base 14 so that source assembly 26 and detector assembly 30 are moved perpendicular to table 46. Particularly, as arm 16 is moved relative to base 14, source assembly 26 and detector assembly 30 traverse around object 50 so that plane of interest 34 is parallel to surface 52 of table 46. For example as shown in Figure 7, in order to scan object 50 positioned on table 46, arm 16 is moved relative to base 14 so that the respective distances between arm first end portion 22 and base 14 and between second end portion 24 and base 14 are altered. More specifically and in one embodiment, arm 16 is moved relative to base 14 so that source assembly 26 is a maximum distance from base 14 and detector assembly is a minimum distance from base 14.

Please delete the paragraph beginning on page 10 at line 19 and ending on page 10 at line 34, and replace with the following replacement paragraph:

A8 Once at least one 3D image has been generated for object 50 using one of the other modes, system 10 is placed into the X-ray fluoro mode to locate in elements within object 50. In one embodiment as shown in Figure 8, where system 10 is positioned along one side of table 46, arm 16 is positioned relative to object 50 and is fixed in position, i.e., arm 16 is positioned so that plane of interest 34 is parallel to base 14 and source assembly 26 and detector assembly 30 are an equidistance from base 14. The distance between source 26 and detector 30 is then adjusted for the selected area to be scanned. Source 28 is then enabled and image data is collected. Source 28 can then be translated along the Z axis of object 50, i.e., the patient, to locate the desired element within the object, i.e., a bone of interest, as the position of detector 32 remains fixed. As source 28 is translated, a series of real-time images along plane of interest 34 are generated in accordance with known fluoroscopy methods to determine the location of the desired element within object 50. A pseudo three dimensional image may then be generated by